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(54) **Transmission joint with bellows dust-guard**

(57) A transmission joint comprising an inner element 1 rigid with a first shaft 2 and drivingly engaged for rotation with an outer element 9 rigid with a second shaft 10 is provided with an elastomeric bellows dust-guard 11 having end collars 12, 14 adapted to be fastened by clamping the one 12 to the outer element 9 and the other 14 to the first joint shaft 2. The inner space 18 of the joint and dust-guard assembly is vented to the surrounding atmosphere by means of a split resilient ring 19 interposed between the first shaft 2 and the corresponding end collar 14, and so shaped as to permit the passage of air along this shaft, in the clamped collar condition when conventional clamping rings 16, 17 have been fitted.

FIG.1

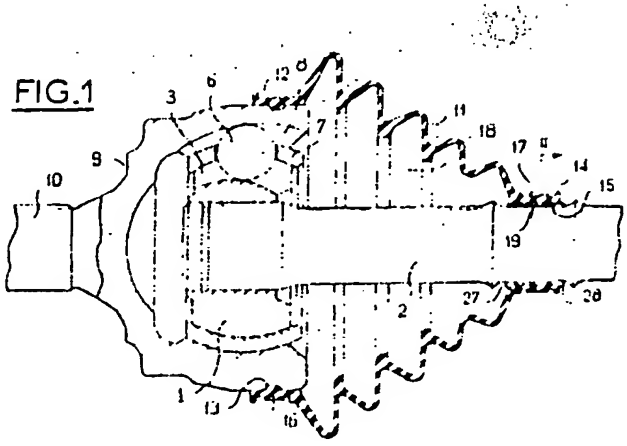

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FIG.1

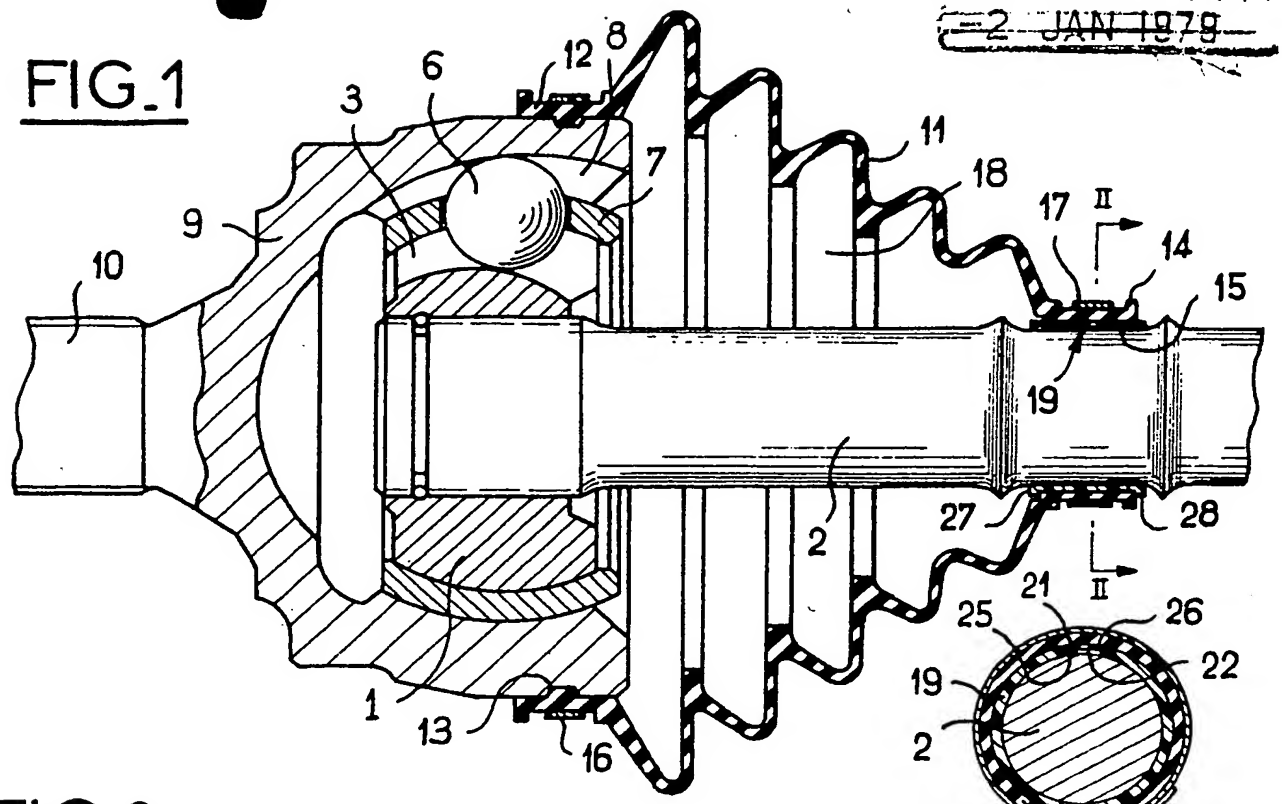


FIG.3

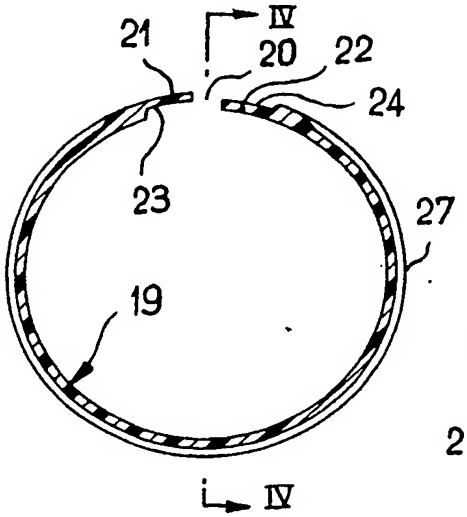


FIG.4

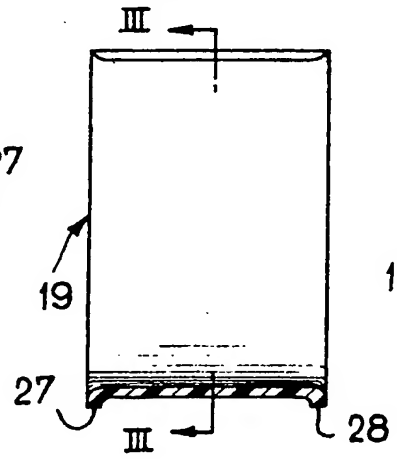
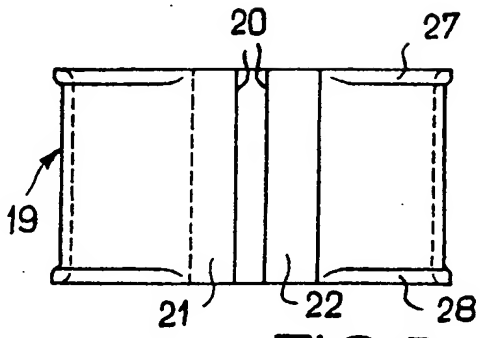


FIG.2

FIG.5



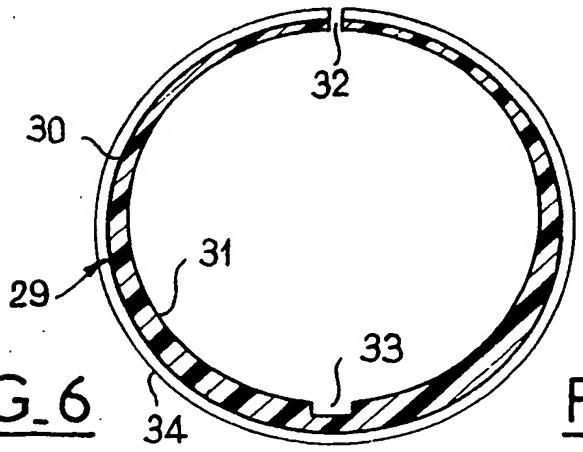


FIG.6

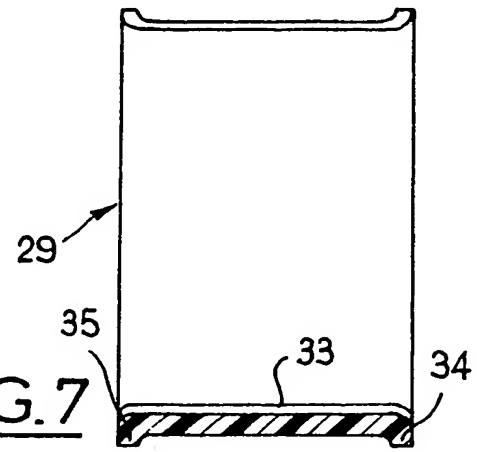


FIG.7

SPECIFICATION

Transmission joint with bellows dust-guard

The present invention relates to a transmission joint with a bellows dust-guard, of the type wherein the joint comprises an inner element rigid with a first shaft and drivingly engaging for rotation an outer element rigid with a second shaft, and the bellows-like dust-guard comprises integral end collars fastened by clamping means, the one to the outer element and the other to the first joint shaft.

It is known that during the operation of a transmission joint of this general type temperature variations occur which are attended notably by an increment in the pressure within the bellows and also by a bellows distortion, aggravated by the joint grease being responsive to the centrifugal pressure, thus developing premature wear and tear of the dust-guard.

Efforts have already been made with a view to avoid this inconvenience by venting the joint and dust-guard assembly to the atmosphere, notably by forming a passage through the first hollow shaft or in the outer element of the joint.

It is the object of the present invention to bend the joint to atmosphere by means of a simple device incorporated in the mounting of the dust-guard.

In accordance with the invention the joint and dust-guard assembly is vented to the atmosphere by means of a resilient split ring interposed between the first shaft of the joint and the corresponding end collar of the dust-guard the ring being so shaped as to provide a free passage for the air along the shaft when the collar is clamped to its final condition.

Use of the split resilient ring entails modification only of the mounting of the dust-guard, should the case arise of fititing the ring to an existing transmission joint not provided with venting means.

This resilient split ring may be held in its proper position by means of simple end shoulders extending on either side of the corresponding collar.

More particularly, the air passage may consist of a gap left at the ring's slit or of a groove formed in the ring proper.

Two typical forms of embodiment of a transmission joint with bellows-type dust-guard incorporating the invention will now be described by way of example with reference to the accompanying drawing, in which:

Figure 1 is an axial section showing a transmission joint and dust-guard assembly of which the inner space is connected to the surrounding atmosphere by means of a split ring;

Figure 2 is a cross-section taken along the line II-II of Figure 1;

Figure 3 is another cross-section taken on a larger scale along th line III-III of Figure 4;

Figure 4 is a longitudinal section taken along the line IV-IV of Figur 3;

Figure 5 is a plane view from above of the split ring of Figure 3;

Figure 6 is a cross-section showing another split ring configuration; and

Figure 7 is a vertical axial section of the same ring.

The transmission joint illustrated in Figure 1 is of a type generally known in the field of transmission notably for automobiles and comprises an inner element 1 rigid with a first shaft 2 provided at its outer periphery with races such as 3 engaged by balls such as 6.

The balls 6 are retained in a cage 7 and also engaged in races like race 8 formed in the inner surface of a bowl-shaped external element 9 of the joint, which is rigid with the other joint shaft 10.

A bellows-like dust-guard 11 made of suitable elastomer has one end formed into a collar configuration 12 adapted to fit around the outer element 9 for engagement in a groove 13, the other end of the dust-guard 11 fitting on the outer shaft 2, i.e. in a groove 15 formed therein, the two collars being fastened in position by means of conventional clamping rings 16 and 17.

In this case the inner space 18 of the joint and dust-guard assembly is vented or connected to the surrounding atmosphere by means of a resilient split ring 19, for example of polypropylene, interposed between the shaft 2 and the fastening collar 14, as illustrated in detail in Figures 3 to 5. In its unstressed condition this ring 19 comprises an axial slit 20. Along this slit, two lips 21 and 22 extend, the first lip 21 being formed with an internal marginal clearance 23 and the second lip 22 being formed with an external marginal clearance 24 both lips being adjacent the slit. These clearances are such that when the ring is fitted in position (see Figure 2) the lips 21, 22 overlap each other only partially, at least on the inner side of the ring, so as to leave between them and the shaft an air passage 25 permitting the communication between the atmosphere and the inner space 18. The gap 26 possibly left externally of the ring by the incomplete overlapping of lips 21 and 22 will be filled substantially completely by the material of collar 14 as a consequence of the tightening thereof by means of the clamping ring 17. It will be seen that external end shoulders or ribs 27 and 28 formed on the greater part of the periphery of ring 19 project on either side of collar 14, thus reliably holding the ring in proper position in the collar.

Another form of embodiment of split ring illustrated at 29 in Figures 6 and 7 is intended for forming the desired air passage along the shaft in a relatively thicker and stronger area of the ring in comparision with the other portion thereof. This result is obtained by positioning the external cicumference 30 of ring 29 eccentrically in relation to the internal circumference 31, and also by positioning the slit 32 in the area of reduced thickness of the ring, thus preventing the dust-guard from being damaged by the ring edge. The thickest portion of ring 29 has an inner groove 33 constituting the desired air passage in th assembled condition of the ring. Also in this case external end shoulders or beads 34, 35 are provided for the same purpose as in the case of shoulders 27, 28 of the preceding form of embodiment.

The air passage thus formed at the fixed end of the dust-guard along the inner shaft of the joint should not become clogged with grease, since the centrifugal force will constantly tend to force this grease onto

the inner space of the joint dust-guard assembly. Moreover, since this air passage is relatively small and formed on a rotating member, any water or foreign particles are safely prevented from penetrating into the transmission joint.

Of course, it will readily occur to those conversant with the art that various modifications and changes may be made in the embodiments shown and described herein, without departing from the scope of the invention as set forth in the appended claims.

CLAIMS

1. A transmission joint with a bellows-type dust-guard of elastomer, wherein the joint comprises an inner element rigid with a first shaft and drivingly engaging for rotation an outer element rigid with a second shaft, the bellows dust-guard comprises end collars fastened by clamping means, the one to the outer element and the other to the first joint shaft, and means is provided for connecting the inner space of the joint and dust-guard assembly to the surrounding atmosphere, characterized in that the connecting means comprises a split resilient ring interposed between the first shaft and the corresponding end collar, and shaped to provide a free air passage along the shaft when the collar is clamped in position.

2. A transmission joint with bellows dust-guard according to claim 1, wherein the split ring has end shoulders extending on either side of the corresponding end collar.

3. A transmission joint with bellows dust-guard according to either of the preceding claims, wherein the ring has two lips adapted to overlap each other along its slit in the clamped condition of the ring on the shaft, the first lip being formed with an inner marginal clearance, the second lip being formed with an outer marginal clearance and the lips being such that they overlap each other only partially, at least on the inner side of the ring, to provide the said air passage.

4. Transmission joint with bellows dust-guard according to either of claims 1 or 2 wherein the said air passage consists of a groove formed on the inner surface of the ring.

5. Transmission joint with bellows dust-guard according to Claim 4, wherein the said groove is formed opposite the ring's slit, and the ring has its outer circumference disposed eccentrically in relation to the inner circumference so that its thickness is greater in the area of the groove than in that of the slit.

6. Transmission joint with bellows dust-guard substantially as hereinbefore described with reference to Figures 1 to 5 of the accompanying drawings or as modified to to include the split resilient ring of Figures 6 and 7.

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